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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/552,582

10/12/2005

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EXAMINER

SUMMONS, BARBARA

ART UNIT

PAPER NUMBER

2817

MAIL DATE

DELIVERY MODE

01/28/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/552,582

Applicant(s)

IWASAKI ET AL.

Examiner

Barbara Summons

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Specification*

1. The substitute specification filed 10/31/07 has been approved and has been entered.

### ***Maintained Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 8, 9 and 12 are rejected under 35 U.S.C. § 102(b) as being anticipated by Weber U.S. 5,864,261 (of record)[cited by Applicants] for reasons of record as stated in paragraph 2 of the prior Office action mailed 7/31/07.

Regarding the amendments to the claims, note that “disposed on” is not considered to be especially different from, or require a different structure than, the previous terminology “provided on”. This holds for all of the maintained rejections.

### ***Maintained Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 2-7, 10 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Weber U.S. 5,864,261 (of record) taken alone, for reasons of record as stated in paragraph 4 of the prior Office action mailed 7/31/07.

6. Claims 1-12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ella et al. U.S. 6,518,860 (of record) in view of Tikka et al. U.S. 6,407,649 (of record) for reasons of record as stated in paragraph 5 of the prior Office action mailed 7/31/07.

#### ***Response to Arguments***

7. Applicant's arguments filed 10/31/07 have been fully considered but they are deemed not persuasive.

Applicants argue that the bottom electrode 37 of the piezoelectric resonator of Weber is also a layer of the acoustical isolator/mirror (see page 9, first paragraph of the response), and therefore, because "the thin film resonator and the acoustical isolator share the bottom electrode", Weber "does not disclose or suggest the piezoelectric thin film vibrator disposed on the acoustical mirror layer such that the bottom electrode of

the piezoelectric film layer is not a part of the acoustical mirror, as required by claims 1 and 10-12" (see page 9, the second paragraph of the response). This argument is considered unpersuasive because it is not commensurate with the scope of the claims. That is, the Examiner disagrees that the claims require that the bottom electrode "is not a part" of the acoustical mirror as asserted by Applicants. For example, as broadly recited in claim 1, the Examiner can consider the acoustic mirror layer to be 43-45 and one half (i.e. the bottom half) of the pair 42, and the resonator 35-37 is "disposed on" the mirror layer. Additionally, the claims in their present form, also do not require an entire acoustic mirror, since they only recite "an acoustic mirror layer" (see e.g. claim 1, line 4). Therefore, the Examiner could also consider only the two constituents of the stack pair 43 and the lower constituent of stack pair 42 to be the "acoustic mirror layer". Furthermore, Weber discloses an acoustical mirror "where 'pairs' are not used at all" (see col. 11, lines 8-13), such that the bottom electrode is just the bottom electrode, although that is not considered required by the claims in their present form.

Applicants next argue that Weber does describe an example of a resonator, "but does not disclose or suggest the effect of the invention of claims 1 and 10-12, such that the acoustic resonator has a band ratio which is larger than or equal to a maximum band ratio obtained in a thin film bulk acoustic resonator in which the thickness of the lower electrode is equal to the thickness of the upper electrode" (see page 9, the third paragraph of the response). This argument is deemed unpersuasive because it is not commensurate with the scope of the claims since there is no functional limitation relating to the band ratio of the resonator in the claims. Only what is claimed need be

disclosed, and the recited structure is considered to be disclosed by Weber as explained in the rejection and response to arguments above.

Regarding the Ella/Tikka combination rejection, Applicants argue that Fig. 7 of Tikka shows "a resonator including separate and distinct layers including... a Tx tuning layer and a bottom electrode, wherein the Tx tuning layer is not the bottom electrode" and argues that the "two separate and distinct layers (i.e. bottom electrode and a Tx tuning layer) cannot be combined and compared to a single bottom electrode" (see page 10, paragraphs 1 and 2 of the response). This argument is unpersuasive because, while the Examiner agrees that Fig. 7 of Tikka shows separate layers, the Examiner also explained in the rejection that the Tx tuning layer may be the same metal material as the top or bottom electrode, so that the two identical material layers do indeed combine to simply make a thicker top or bottom electrode, as is explicitly shown in Ella Fig. 1, where the resonator of the GMS filter has a top electrode of 300nm of Al + 105nm of Al for tuning = 405nm Al top electrode. In order for the Al tuning layer to not be considered part of either the top/bottom electrode, special connection to only the portion labeled "bottom electrode" or "top electrode" would be required and this simply is not the case when a metal the same as the electrode material is used, unlike when a dielectric is used (see e.g. Tikka col. 6, lines 1-19). When the tuning layers are the same metal as the electrodes, the combined layers form the effective top or bottom electrode and connection can be made thereto via the tuning layer which is integral with, and necessarily a part of, the top or bottom electrode, as best seen in Ella Fig. 1, and it is the thicker top or bottom electrode that provides the necessary frequency

difference between the series and shunt resonators of the ladder filter in order to form the pass band of the ladder filter. The Examiner is also citing a reference (see Bradley) below, which provides evidence that a metal bottom core electrode and metal bottom tuning layer are combined to be considered the "bottom electrode" of the resonator.

***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bradley et al. U.S. 6,874,211 discloses an acoustic resonator with a bottom electrode that is thicker than the top electrode, and also provides evidence that a metal bottom core electrode and a metal bottom tuning layer are in combination considered to

be a bottom electrode of an acoustic resonator (see layers 113 and 112 of resonator 110 in Fig. 4 with col. 7, lines 17-21).

Milsom et al. U.S. 2006/0131990 also discloses an acoustic resonator with a bottom electrode that is thicker than the top electrode (see Fig. 2 and the abstract), wherein it should be noted that the PCT document published in the English language.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

bs  
January 21, 2008

  
**BARBARA SUMMONS**  
**PRIMARY EXAMINER**